Grade ≥ 2 toxicity, there were 3 and 1 patient with pneumonitis Grades 2 and 3, respectively; one patient had Grade 2 diarrhea; and one patient experienced Grade 3 lower gastrointestinal hemorrhage. On univariate analysis, having a longer time from the primary tumor diagnosis date to the oligometastasis was associated with lower risk of mortality ($P = 0.03$). In contrast, the lack of complete/partial response ($P = 0.04$) or having a greater oligometastasis size (HR = 4.5; $P = 0.01$) was associated with higher risk of mortality. On multivariate analysis, only the response to the HT retained significance ($P = 0.01$).
Conclusions. Hypofractionated image-guided HT is well tolerated and offers adequate local control with low acute morbidity in patients with extracraneal oligometastatic disease. We found that the response to HT was the only predictor for OS.

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Stereotactic body radiation therapy (SBRT): Preliminary results

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Introduction. Stereotactic body radiation therapy (SBRT) is a novel treatment modality in radiation oncology that delivers a very high dose of radiation to the tumor target with high precision using single or a small number of fractions. SBRT is the result of technological advances in patient/tumor immobilization, image guidance, and treatment planning and delivery. This modality is safe and effective in both early stage primary cancer and oligometastases.
Objective. We present our experience in the treatment of primary and metastatic tumors with SBRT.
Methods. Between April 2012 and February 2013, 22 patients with 24 different locations underwent SBRT for primary and metastatic tumors using CT and/or PET-CT for diagnosis. Treatment was made using vacuum body fixation and abdominal compression (in some cases) to reduce intrafractional organ motion. We made three planning CTs in all patients: free breathing, inhalation and exhalation. Internal target volume (ITV) was delineated based on fusion of three CTs. Planning target volume (PTV) was then determined by adding additional setup margin to ITV. The locations of the treatments were distributed as follows: 11 primary lung tumors, 6 lung metastases, 3 adrenal metastasis, 3 lymph node metastasis and 1 vertebral metastases. We have made different fraction schemes, from 12 Gy in 5 fractions (60 Gy) until 4 Gy in 10 fractions (40 Gy).
Results. The acute toxicity has been excellent, appearing only G1 pneumonitis. Assessment of response was performed with CT and/or PET-CT, with a 80% of local control.
Conclusions. SBRT is a treatment option for many inoperable patients with primary and metastatic tumors and provides a great benefit, because of its high efficiency, with a control of lesions in more than 85% of cases, and excellent clinical tolerance due to lowest toxicity.

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Stereotactic body radiation therapy for lung tumors: Analysis of margin requirements and treatment time

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Purpose. We have analyzed our experience with stereotactic body radiation therapy (SBRT) in lung tumors. We have determined our treatment accuracy using Bodyfix® as immobilization system and conebeam CT (CBCT) for image guidance, and the set-up and treatment times using different planning systems.
Methods and materials. We have studied the patients treated from August 2011 to December 2012. Every patient underwent 4DCT after immobilization with Bodyfix®. We contoured the internal target volume (ITV) and we created a planning target volume (PTV) with a 5 mm expansion. A stereotactic RT plan was designed using 7–9 coplanar and noncoplanar fields, dynamic arcs or a combination of both of them. Before each fraction a CBCT was made for image guidance. We have measured the set-up time (total time in treatment room minus beam-on time) and the treatment time (beam-on time), comparing the length of treatment between different RT plans. We have made CBCT after treatment to study the intrafraction tumor movements.
Results. Eighteen patients have been treated. Nine patients were treated with fixed fields, seven with dynamic arcs and two with a combination of arcs and fields. Mean times for treatment were 10.4 min, 4.3 min and 4 min, respectively, being arc-therapy significantly faster than fixed fields treatment ($p = 0.006$). First fraction set-up mean time was 35.7 min, significantly longer than overall set-up mean time, that was 27.8 min ($p < 0.05$). The mean intrafraction tumor motion was 0.2 cm (0–0.4) in AP, 0.2 cm (0.1–0.5) in SI and 0.2 cm (0–0.5) in ML direction.